

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.





# Research Note

## NORTHERN ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION.

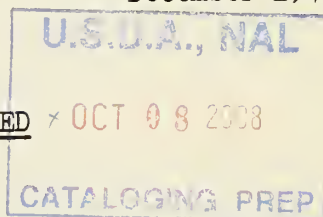
No. 67

Missoula, Montana

December 1948

COTTONWOOD RAILWAY TIE TEST COMPLETED \* OCT 9 8 2008

✓ Lincoln A. Mueller  
Forest Utilization Service 1/



In March 1910 the Northern Pacific Railway Company installed 261 treated cottonwood ties in its Bitterroot branch line near Lolo, Montana. The purpose of the installation was to determine the suitability of cottonwood (Populus trichocarpa) for railroad ties.

The ties were cut in western Montana, and after being air-seasoned they were treated by the Lowry pressure process at the Northern Pacific treating plant located at Paradise, Montana. A mixture of 80-percent grade 1 coal-tar creosote and 20-percent refined coal tar was used as a preservative, and a retention of 8 pounds per cubic foot was obtained. The ties were not incised.

The original installation was made on a dirt ballast using 56-pound rails without tie plates. In 1918, or 8 years later, the ties were equipped with 6x8-inch tie plates. In 1923 the track was relaid with 85-pound rails.

Although the traffic on this line was relatively light and confined to slow speeds, the 8 years of use without tie plates caused some mechanical damage to the ties.

Regular inspections of the test track were made at 1- and 2-year intervals beginning in 1923. Since 1936 a member of the Northern Rocky Mountain Forest and Range Experiment Station assisted in making the inspections.

In the fall of 1947, or after more than 90 percent of the average life of the ties had been realized, Northern Pacific Railway officials decided the test had served its purpose and it was officially closed. The final inspection that prompted this action revealed that 151, or approximately

---

1/ Acknowledgment is made to Messrs. A. J. Loom and C. L. Willcutt of the Northern Pacific Railway Company for making this information available; and also to Mr. C. N. Whitney, formerly of the Forest Utilization Service, for making numerous inspections of the project.



58 percent, of the original 261 ties were still in service. Of this number 12 ties were classified as good, having 5 or more years of service life; 65 as fair, having 3 to 4 years of additional service life; and 74 as badly decayed, in need of replacement within 2 years. The 110 ties, or 42 percent of the total that had been replaced during the duration of the test, showed an average life of approximately 28 years. A weighted average of the service life of all ties in the test, including the additional service that remained at the time the test was closed, places the average service life for all ties in the test at 35 years.

The following table gives detailed service records for this installation:

Condition of Cottonwood Railway Ties in the Northern Pacific  
Test Track (Bitterroot Branch) near Lolo, Montana,  
at Final Inspection, September 1947

Age of	:	:	Condition of ties, September 1947	:	:	Average	:
test at	:	:		:	:	life of	:
final	:	Number	:	:	:	ties	Average
inspect'n:	:	of ties:	:	:	:	Removed:	life of
September:	:	in test:	Good 1/:	Fair 2/:	Poor 3/:	all	removed
1947	:	:	:	:	:	causes	all ties
<u>Years</u>		<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Years</u>
37.5		261	4.60	24.90	28.35	42.15	28.03
							35.04

1/ "Good" condition means life expectancy of 5 years or more.

2/ "Fair" condition means life expectancy of 3 to 4 years.

3/ "Poor" condition means life expectancy of 1 to 2 years.

